

## WHAT IS CLAIMED IS:

3 1. A method for detecting faults in a transducer including a secondary winding having at least two voltage outputs, said method comprising the steps of:

summing the voltage outputs to obtain a summed voltage value;

5 determining a difference between a current value of the summed voltage value to a reference value; and

if an absolute value of the difference between a current value of the summed voltage value and the reference value exceeds a freeze threshold, then maintaining the reference value constant. may be allowable

10 2. A method in accordance with Claim 1 wherein if the absolute value of the difference between a current value of the summed voltage value and the reference value exceeds a default threshold, then generating a fault indicator signal. Drawing

15 3. A method in accordance with Claim 2 wherein if the absolute value of the difference between a current value of the summed voltage value and the reference value is less than the fault threshold, then generating a confidence factor indicative of a likelihood that a fault has occurred. VDTFLT 112 <sup>ms</sup>

Sub AB 4. A method in accordance with Claim 3 wherein the freeze threshold value is about 0.05 Vrms, and wherein the fault threshold value is about 0.08 Vrms. 112 <sup>ms</sup>

20 5. A method in accordance with Claim 1 wherein the reference value is representative of a value of a sum of the secondary voltages of the transducer under no faults.

Sub AB 6. Apparatus for detecting faults in a transducer including a secondary winding having at least two voltage outputs, said apparatus comprising:

a short term filter for generating a first voltage value representative of a current value of a sum of the secondary winding output voltages;

a long term filter for generating a second voltage value representative of a non-faulted value of a sum of the secondary winding output voltages; and

5      a comparator for generating a difference signal representative of a difference between the first voltage value and the second voltage value.

7.      Apparatus in accordance with Claim 6 wherein said short term filter comprises a one pole lag filter. *Not shown in fig.*

10      8.      Apparatus in accordance with Claim 7 wherein said one pole lag filter has a time constant of 0.150 seconds.

9.      Apparatus in accordance with Claim 6 wherein said long term filter comprises a one pole lag filter.

10.      Apparatus in accordance with Claim 9 wherein said one pole lag filter has a time constant of 30 seconds.

15      11.      Apparatus in accordance with Claim 6 wherein if an absolute value of the difference between the first voltage value and the second voltage value exceeds a freeze threshold, then said long term filter maintains said second voltage value constant. *how 112 ms*

20      12.      Apparatus in accordance with Claim 11 wherein if the absolute value of the difference between the first voltage value and the second voltage value exceeds a fault threshold, then said apparatus generates a fault indicator signal. *drawings*

13.      Apparatus in accordance with Claim 12 wherein if the absolute value of the difference between the first voltage value and the second voltage value is less than the fault threshold, then said apparatus generates a confidence factor. *drawings*

14. Apparatus in accordance with Claim 12 wherein the freeze threshold value is about 0.05 Vrms, and wherein the fault threshold value is about 0.08 Vrms.

15. Apparatus for detecting faults in a transducer including a secondary winding having at least two voltage outputs, said apparatus comprising:

a short term filter for generating a first voltage value representative of a current value of a sum of the secondary winding output voltages, said short term filter comprising a one pole lag filter;

a long term filter for generating a second voltage value representative of a non-faulted value of a sum of the secondary winding output voltages, said long term filter comprising a one pole lag filter; and

a comparator for generating a difference signal representative of a difference between the first voltage value and the second voltage value, if an absolute value of the difference between the first voltage value and the second voltage value exceeds a freeze threshold, then said long term filter maintains said second voltage value constant, and if the absolute value of the difference between the first voltage value and the second voltage value exceeds a fault threshold, then said apparatus generates a fault indicator signal.

16. Apparatus in accordance with Claim 15 wherein said short term one pole lag filter has a time constant of 0.150 seconds.

17. Apparatus in accordance with Claim 15 wherein said long term one pole lag filter has a time constant of 30 seconds.

18. Apparatus in accordance with Claim 15 wherein if the absolute value of the difference between the first voltage value and the second voltage value is less than the fault threshold, then said apparatus generates a confidence factor.